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Health habits, behavioural self-control and academic performance

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Abstract

Poor health habits in adolescents seem to affect their optimal academic performance; the possible effect associated behaviour patterns may be added to this. A group of secondary students was assessed, by means of the GSHS, CACIA and the CARAS-R, comparing data obtained with results from the subjects of Mathematics and Language. From the different correlations gathered, those linking age with alcohol and drug consumption and higher body mass index are to be emphatised; academic performance with better nutrition, hygiene and effectiveness of attention along with a lower alcohol and drug consumption rates; proper eating habits with best results define self-control behaviour. On the other hand, the negative effect of alcohol on several dimensions analised is to be mentioned as well as the relation of the construct "reward delay" with more appropriate habits that favour health.

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Keywords:

1. Introduction

Adolescence is a crucial period in life and accompanied by important physiological and psychological changes that can subsequently have a significant influence on adult life. During this period, it is particularly important for adolescents to adopt appropriate life habits to ensure a healthy lifestyle, including aspects such as doing the right amount of physical exercise, eating healthily and maintaining a good standard of hygiene (Delgado, Gutiérrez & Castillo, 1999; Southon, Wright, Finglas, Bailey, Loughridge & Walker, 1994). Complementarily, numerous

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studies have shown the positive impact that is associated to the development of guidelines as well as to the negative effect that stems from the non-adherence to those (Rodríguez-Hernández, De la Cruz-Sánchez, Sebastián Feu & Martínez-Santos, 2011) and, on the other hand, the existence of risk behaviour starting to manifest at this stage, such as the consumption of alcohol, tobacco and other types of addictive substances (Dishion, Kavanagh, Schneiger, Neilson & Kaufman, 2002). Making a choice about a lifestyle conditions the development of school life and more specifically, academic performance (Dishion et al., 2002; Taras, 2006).

2. Objectives

Analysing the possible relationship between the different variables and habits linked to adolescent health against academic results obtained in strong core subjects, examining at the same time, the potential effect of parametres that integrate behavioural self-control.

3. Methodology

The sample was composed of 42 students (21 boys and 21 girls) who were part of the first, second, third and fourth grades of a secondary school in the region of Cantabria (Spain). Ages ranged from 8 to 11 years (Mean: 9.61, SD: 1.15). The average age obtained was calculated in months (M: 174.60 months, DS: 20.24; Range: 232-150).

Information was collected in compliance with requirements for anonymity and the consent of legal guardians. The process took place during regular school hours over the academic year 2012-13, after receiving permission from the school's administrative team.

The following tests were applied:

- The Global school-based student health survey / GSHS (World Health Organization, WHO), is a school-based survey conducted primarily among students aged 13-17 years. The GSHS uses a standardized scientific sample selection process; common school-based methodology; and core questionnaire modules, core-expanded questions, and country-specific questions that are combined to form a self-administered questionnaire which can be administered during one regular class period. Countries develop their unique questionnaire for students using the three components described above: Core Modules, Core Expanded questions and Country Specific questions. The questions are translated into the appropriate language of instruction for the students and pilot tested for comprehension. All questions share common characteristics to enhance the flow of the survey and comprehension by the student. To help protect student privacy, no skip patterns are allowed. The 10 core questionnaire modules address the leading causes of morbidity and mortality among children and adults worldwide: alcohol use, dietary behaviours, drug use, hygiene, mental health, physical activity, protective factors, sexual behaviours, tobacco use and violence and unintentional injury.
- Perception of differences test - Revised / CARAS-R (Thurstone & Yela, 2012). This test assesses the ability to quickly and correctly perceive similarities and differences and partially-ordered stimulant patterns. With the use of 60 graphic items, consisting of basic line drawings of faces, the task is to determine which of the three faces that make up each element is different from the other two. For this study, we use 'ICI' (Impulse Control Index) scores, which determine the subject's impulsive or reflexive pattern, and a 'Correct answer' score, which, in our case, determines attentional efficiency.
- Adolescent Self-Control Questionnaire / CACIA (Capafóns & Silva, 1995). It assesses basic processes and self-control skills necessary to effective achievement of self-control in children and adolescents. It specifically consists of an 89-item questionnaire that analises self-control by means of 4 scales, three positive ones (Personal Feedback, Reward Delay and Criterial Self-Control) and a negative one (Processual Self-Control). High score in Personal Feedback (PF) indicates good capacity to discover yourself, to realise the consequences of own actions and an interest to find out reasons that determine personal behaviour. At the same time, a high score in Reward Delay (RD) would show organised behaviour and structuring in activities as well as the skill to stick to tasks and aims, not easily ceding to own impulses or attractive stimuli. Regarding Criterial Self-Control

(CSC), a high score reflects that the subjects have good resistance to stress and tolerance in threatening situations, and indicates the ability to withstand distressing situations. A high score on the negative scale, on the other hand, represented by Processual Self-Control (PSC), indicates feelings of unease and annoyance for having one's behaviour questioned, as well as concern about having to act rigidly in accordance with norms and rules.

4. Results

Table I shows results obtained by the group regarding the variables assessed by means of tests applied as well as those required from the education centre.

Table 1: Descriptive Statistics (central tendency measures)

Tests	**M**	**SD**	**Range (Max/Min)**
Mathematic	5.98	2.18	10.00/2.00
Language	6.61	1.85	10.00/4.00
Body Mass Index	19.89	2.65	26.00/14.00
Exercise	15.26	3.81	20.00/6.00
Alcohol	5.05	5.62	16.00/0.00
Tobacco	4.02	4.38	16.00/0.00
Drug	0.74	1.98	9.00/0.00
Hygiene	12.33	3.15	16.00/2.00
Personal Feedback	13.40	4.21	21.00/3.00
Delayed Reward	11.50	4.28	18.00/1.00
Criterial Self-Control	6.68	1.55	10.00/2.00
Processual Self-Control	20.40	3.48	25.00/5.00
Attentional Efficiency	39.68	9.11	58.00/16.00
Impulse Control Index	95.70	6.87	100.00/73.00

Table 2 gathers the levels of correlation of factors in the questionnaires.

Table 2: Correlations matrix among the variable assessed

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. IMC	1.00												
2. EH	-.032	1.00											
3. PE	.007	.342*	1.00										
4. AL	.001	-.353*	-.442**	1.00									
5. TO	.250	-.397**	-.354*	.512**	1.00								
6. AS	.121	-.216	-.171	.483**	.687**	1.00							
7. HY	.201	.385*	.449**	-.427**	-.152	.006	1.00						
8. PF	.385*	.400*	.372*	-.405**	-.150	-.067	.491**	1.00					
9. DR	.056	.533**	.406**	-.559**	-.560**	-.473**	.533**	.590**	1.00				
10. CSC	.073	.421**	.375*	-.397*	-.255	-.194	.356*	.559**	.474**	1.00			
11. PSC	.162	.188	-.012	-.002	.148	.013	.085	.160	.134	.029	1.00		
12. AE	.211	.254	.001	-.255	-.196	-.401**	.173	.275	.463**	.193	.211	1.00	
13.ICI	.269	-.209	-.299	-.240	-.080	-.302	-.055	-.049	-.030	-.147	-.006	.368**	1.00

* p <.05 ** p< .01

Note: BMI (Body Mass Index), EH (eating habits), PE (physical exercise), AL (Alcohol), TO (Tobacco), AS (addictive substances), HY (Hygiene), PF (Personal Feedback), DR (Delayed Reward), CSC (Criterial Self-Control), PSC (Processual Self-Control) , AE (Attentional Efficiency), ICI (Impulse Control Index).

Together with the data shown in Table 2, a direct relationship between age and consumption of alcohol (r = .555, p <.01) and drugs (r = .466, p <.01) was also discerned, being opposite to the marks in Mathematics (r = -.428, p <.01) and Language (r = -.376, p <.01). With respect to performance in Mathematics, there was a correlation with the marks in Language (r = .756, p <.01), as there also was regarding healthy eating (r = .381, p <.05) and hygiene habits (r = .317, p <.05), and attentional efficiency (r = .325, p <.05). In addition, an inverse relationship was shown with inappropriate levels of alcohol consumption (r = -.359, p <.05). Finally, performance in Language, together with the aforementioned correlations, indicated an inverse relationship with higher levels of alcohol (r = -.455, p <01) and drug consumption (r = -.395, p <.05). The mark in Language showed a direct relationship with levels of attentional efficiency (r = .511, p <.01), delayed reward (r = .511, p <.01) and better eating habits (r = .370, p <.05) and hygiene (r = .374, p <.05).

Table 3 shows the different results from the variables contrasted by means of the "sex" variable.

Table 3: T from Student test for comparative assessment between sexes

	Levene		T				
	F	p	t	p	Mean Dif.	WM (SD)	MM(SD)
Math	.020	.889	.210	.835	.145	6.05(2.28)	5.90(2.14)
Lang	.536	.469	.977	.335	.567	6.90(1.77)	6.33(1.93)
IMC	.906	.349	-1.608	.119	-1.501	19.06(2.92)	20.57(2.27)
EH	.004	.951	1.962	.057	1.810	17.14(2.85)	15.3(3.12)
PE	1.100	.301	.683	.498	.810	15.67(3.42)	14.86(4.21)
AL	.101	.752	.163	.872	.286	5.19(5.43)	4.90(5.44)
TO	.271	.606	.950	.348	1.286	4.67(4.58)	3.38(4.17)
AS	.964	.332	.384	.710	.238	0.86(2.30)	0.62(1.65)
HY	.077	.783	1.283	.207	1.238	12.95(3.10)	11.71(3.14)
PF	1.199	.280	-.104	.918	-.140	13.33(3.79)	13.47(4.73)
DR	2.003	.165	.623	.537	.852	11.90(4.78)	11.05(3.73)
CSC	.704	.407	.165	.869	.083	6.71(1.79)	6.63(1.30)
PSC	2.365	.132	2.254	.030	2.366	21.52(2.08)	19.16(4.28)
AE	5.509	.023	.194	.847	.552	39.95(11.25)	39.40(6.44)
ICI	1.499	.228	-1.968	.056	-4.085	93.71(7.04)	97.80(6.19)

5. Discussion and Conclusions

As our results showed, there was an increase in alcohol and drug consumption as the age in adolescents increased in keeping with previous research. Thus, it is known that drug consumption is a phenomenon related to human development, increasing almost linearly from the beginning to the end of adolescence (Young, Corley, Stalling, Rhee, Crowley and Hewitt, 2002). This tendency is also detected in other latitudes, as shown by social and demographic research carried out in Mexico (Medina-Mora et al., 2008). On the other hand, the body mass index also showed this increase with the age. In this case, our sample shows a statistical trend as, according to some social-demographic studies generated in our country, the percentage of children (6-10 years of age) that are overweight and obese increases in comparison to the percentage detected for adolescents (Martínez et al., 2004).

There seems to be a dual pattern with two profiles of health behaviour, one a healthy lifestyle and another characterized by potentially abnormal habits. Accordingly, for example, an adolescent who develops good eating habits would, at the same time, show good levels of exercise and hygiene standards. These parameters, in turn, would be related to personal feedback (PF), delayed reward (DR) and criterial self-control (CSC). Moreover, these positive indicators would be accompanied by significant control and moderation in the consumption of tobacco and alcohol. From among the numerous explanations that could justify this correlation, we highlight that which assigns to the physical activity carried out by the adolescent, anxiolytic, antidepressant and stress reduction effects (Dunn

et al, 2001). As we know, stress and emotional disturbance represent one of the main causes of drug consumption and abuse in adolescence (Calvete & Esteve, 2009).

Complementarily, it was found that there was a clear connection between inadequate levels of consumption of alcohol, tobacco and drugs, which corroborates the existence of a tendency to connection among addictions during adolescence (Hisbell et al., 2000), along with a lack of healthy guidelines (poor nutrition, hygiene and physical exercise practices) and behaviour control parameters such as RP, RR and ACC. The linkage between adolescence and abnormal lifestyle standards, including higher vulnerability for tobacco, alcohol dependency as well as other additions, improves by late maturing in brain areas governing motivation and impulsivity control (Valiente-Barroso, 2011).

On the other hand, the female sample showed greater concern about self-assessment, self-gratification and self-punishment linked to anxiety over behaviour and concern about having to act rigidly in accordance with the rules, which, in turn, is associated with anxiety and neuroticism (Capafons & Silva, 1995), which, at the same time, represent variables that, according to the research, are associated (Gray, 1994). Furthermore, this result is consistent with the female preponderance for these disorders, as recorded in the literature (Carrasco-Galán & Espinar-Fellmann, 2008).

Finally, academic performance was higher in students with lower rates of alcohol consumption. In this regard, we recall that alcohol problems can affect the psychological development of adolescents and negatively influence both their school environment and their leisure time (Currie et al., 2000). Besides, it has been shown that the consumption of addictive substances affects school performance and early school leaving (Dishion, Kavanagh, Schneiger, Neilson & Kaufman, 2002). At the same time, the level of performance would be linked to good eating habits; as it has been shown, nutritional deficiencies (malnutrition from a lack of proteins/energy, iron, vitamin A and iodine deficiency), affect participation and learning at school (Taras, 2006). It should be pointed out that, at these ages and due to different circumstances, it is frequent to check for poor breakfast and be aware of the repercussion of school performance as it is the most important meal of the day (Fernández Morales, Aguilar Vilas, Mateos Vega & Martínez, 2008). On the other hand, the correlation between good hygiene and better school results, corroborates what previous studies show. For instance, it is known that oral and dental hygiene can prevent pain and discomfort, whereas poor oral health may affect the child´s capacity to communicate and learn. As previously mentioned, more than 50 million school hours a year are missed due to oral health issues (Kwan et al., 2005). In turn, the association between higher scores with delayed reward and attentional efficiency is consistent with what would be expected, given that attentional capacity represents a cognitive support for other learning processes (Londoño Ocampo, 2009). At the same time, this correlation refers to the importance of executive functioning in academic performance, as has been shown in previous studies for these two specific subjects (Valiente-Barroso & García García, 2013).

In conclusion, we can affirm that there is a close relationship between academic performance and good health habits during adolescence. Positive standards are frequently presented as being associated, like the negative ones, with the establishing of two profiles (healthy vs. abnormal) in the adolescent population. It is crucial for these considerations to be taken into account by those responsible for health and education, for the repercussions that they could represent in adolescent development and the undoubted influence that they could have in later adult life.

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